STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

December 5, 2007

William Mitchell
Arch Chemicals Inc.
1200 Lower Ridge Road NW
P.O. Box 800
Charlestown, TN 37310

Re: Comments – Ecological Risk Assessment Work Plan for Arch Chemicals Inc., 350 Knotter Drive, Cheshire, CT
EPA ID No. CTD98016799

Dear Mr. Mitchell:

I am forwarding comments prepared by the Environmental Protection Agency Region 1 (EPA) on the Ecological Risk Assessment Work Plan dated April 2007 and submitted by ENSR Corporation for Arch Chemicals Inc., located at 350 Knotter Drive, Cheshire, Connecticut.

If you have any questions, you can contact Stephanie Carr of EPA at (617) 918-1363 or myself at (860) 424-3300.

Sincerely,

Sandra Brunelli
Environmental Analyst 3
Remediation Division
Bureau of Water Protection and Land Reuse

c: Ray Cody, EPA Region 1
Ms Michelle Snyder, Project Manager, ENSR, 2 Technology Park Drive, Westford, MA 01886-3140
Stephanie Carr US Environmental Protection Agency Region 1 New England, Congress Street, Suite 1100 (HBT) Boston MA 02114-2023

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
11 TECHNOLOGY DRIVE, CHELMSFORD, MA 01863

DATE: November 13, 2007

SUBJ: *Review of the Ecological Risk Assessment Workplan, Arch Chemicals, Inc., 350 Knotter Dr., Cheshire, CT, dated April 2007*

FROM: David McDonald, OEME/ECA

TO: Ms. Stephanie Carr, USEPA Region1/RCRA/PM

Dear Stephanie:

Thank you for allowing us the opportunity to assist you in the review of the *Ecological Risk Assessment Workplan, Arch Chemicals, Inc., dated April, 2007.* The review was performed, on this document, utilizing supporting information i.e. a 2004 verification report to the State of Connecticut required with property transfer under the Connecticut Transfer Act and in accordance with the Remediation Standard regulations. The purpose of this review is to ensure that the ecological risk assessment (ERA) concerns relating to the study of this site meet the requirement of the RCRA program. Please be aware that the goals of the verification report and of an ERA under RCRA are quite different. Due to this difference the usefulness of the information in the verification report is limited.

As you will see by the review report below, the work currently proposed in support of the ERA effort falls short in providing the minimum necessary information allowing for a reasonable evaluation of ecological risk potential. All reasonably possible site related releases must be evaluated as they relate to risk of harm to ecological receptors expected or believed to be present. Media of ecological interest associated with this site include surface water, surface sediment from 0-6inches and surface soils from 0-2 feet in depth. It is reasonable to expect that each of these media is sampled to provide an accurate representation of contaminants present. These data would then be compared to ecologically relevant effects thresholds. In addition, the taking of local background samples, representing the various media of interest, should be considered to allow for a determination of site and non-site contributions of risk. The following attached review memo provides the results of the review.

If you have further questions or require further assistance, feel free to contact me at (617) 918-8609 or email me at mcdonald.dave@epa.gov.

Sincerely,

David F. McDonald
USEPA Region 1 Biologist

Review of the
Ecological Risk Assessment Work Plan,
Arch Chemicals Inc., Cheshire, CT.
dated April 2007

1.0 GENERAL INTRODUCTION

1.1 Task Description

The Environmental Services Assistance Team (ESAT) at the request of the Environmental Protection Agency (EPA) reviewed the Ecological Risk Assessment (ERA) Work Plan (WP) dated April 2007 that was prepared for the Arch Chemicals, Inc. facility (the Site), located in Cheshire, CT . The review included the use of additional information on the Site and on past site investigation efforts obtained from a Verification Report, dated March 2004.

The goal of the review was to ensure that the proposed WP allows for the evaluation of risk potential from suspected contaminated surface water, surface soil and surface sediment following USEPA ecological risk assessment guidance. The results of the sampling and analysis of these media in conjunction with ecological effects based screening values will result in information necessary to assess the potential for ecological risk from the Site.

1.2 Site History

The facility is located at the Cheshire Industrial Park, in Cheshire, CT. It covers about 75 acres, 45 acres of which are occupied by a 144,700 square foot building, lawns, a parking lot, and service roads. The remainder of the property consists of undeveloped wetlands, two detention basins, and wooded areas.

The Site was occupied by Siemens, a medical equipment manufacturing company, from its construction in 1975 to 1983. Olin Chemicals, Inc. (Olin) acquired the Site in 1983 for use as a Research and Development (R&D) laboratory focusing on swimming pool chemicals, surfactants, liquid toners, urethane compounds, and biocide compounds. Project-specific specialty chemicals, such as propellants for explosives, have also been used in R&D at the facility.

Arch Chemicals, Inc. (Arch) was created in 1999 as a separate entity comprising the former pool chemicals division of Olin. This transaction qualified as a property transfer under the State of Connecticut Transfer Act. A second Transfer Act requirement was triggered when Arch sold the facility in 2000. It currently leases a portion of the facility from the new owner to continue operations.

The Transfer Act assessment involved collecting soil and groundwater samples from Areas of Concern (AOCs) located throughout the Site to determine if the Site complied with the Connecticut Remediation Standard Regulation (RSR) or if remediation to achieve RSR compliance would be required. This investigation, which occurred between 1999 and 2002, showed that the Site met all applicable soil and groundwater criteria and that remediation was not necessary.

To meet corrective action obligations the facility is also required to evaluate current or future risk to the environment. As a consequence a Screening-Level Ecological Risk Assessment (SLERA) is scheduled to be performed at the Site in support of these activities. A qualitative habitat characterization was conducted in 2007 to identify on-Site ecological habitats and potential receptors, and to conduct a qualitative reconnaissance of the adjacent water bodies.

This technical memorandum is organized as follows: section 2.0 provides general comments on the WP, Section 3.0 provides specific comments on the WP, and section 4.0 is a summary and conclusion.

2.0 GENERAL COMMENTS

General comment 1:

The review identified major issues with the proposed WP for this Site. The analytical data proposed for use in the SLERA were collected for purposes other than ecological risk screening i.e. Connecticut Remediation Standard Regulation (RSR) which is a human health based risk evaluation.

Because ecological and human health risk evaluations often times require different types of data there are significant gaps with the current dataset.

The SLERA to be developed under the proposed WP will not provide the EPA with the information needed to make defensible ecological risk management decisions. It is recommended to amend the WP based on the comments provided below in order to develop a more defensible SLERA.

General comment 2:

The WP stated that the primary exposure pathways to be evaluated in the SLERA will be direct exposure to surface soils and surface water. Yet, the Site also contains two detention basins covering about five acres, and several wetland areas. Such habitats can concentrate contaminants in their sediment substrate. Therefore, it is necessary that sediment be included as a third exposure pathway to be evaluated in the SLERA. The immediate receptor group would be represented by benthic invertebrates. The WP needs to be amended to provide a sediment sampling program for the aquatic habitats associated with the Site in support of the SLERA. Appropriate conservative sediment screening benchmarks must be identified for use in the risk characterization of this medium.

General comment 3:

The WP proposed assessing risk to aquatic receptors in the wetlands and the two detention basins by applying a Dilution Attenuation Factor (DAF) to existing groundwater data. The reason for this indirect approach was that surface water samples have not been collected from the aquatic habitats at the Site. Clearly, sampling of surface water associated with areas of site discharge would provide the most compelling data with the least amount of uncertainty.

The proposed approach is unacceptable for three reasons: (1) it does not follow EPA ERA guidance which requires actual surface water data for use in a SLERA, (2) it uses the unproven assumption that groundwater at the Site discharged to the wetlands and/or the detention basins, and (3) it ignored potential contributions from overland flow, on-Site storm water outfalls from parking lots or service roads, or off-Site sources to these surface water habitats.

The WP needs to be amended to include a surface water sampling program at the Site in support of the SLERA. Samples need to be collected from all potentially impacted surface water bodies associated with site discharge. Consideration for seasonal exposure potential should be made as necessary. For example, if water bodies are seasonally flooded sampling of surface water should be taken during these times of exposure to sensitive receptors. See also General Comment 4 for additional considerations.

General comment 4:

The WP indicated that surface water from the two detention basins flowed into the nearby Ten Mile Brook, located less than one-quarter mile east of the Site. However, the report was unclear if these outflows were permanent or intermittent, the intensity of flows during discharges, or if they represented a separate aquatic habitat which should also be evaluated. More information needs to be provided to ensure that this potential habitat is included in the SLERA, if necessary. Additional surface water and sediment samples may need to be collected from these conduits or point of confluence depending on further information on characteristics of these areas.

General comment 5:

The WP did not discuss collecting background samples for soil, surface water, or sediment from nearby reference areas. Such analytical data can help determine if detected contaminants may have

originated from the Site or have a more regional distribution. The WP should be amended to collect the necessary media-specific, background samples in support of future eco risk-based decision making at the Site.

General comment 6:

The WP described the non-permitted release between 1984 and 1988 of chiller condensate and non-contact cooling water to a drainage ditch located to the southeast of the Site building. The presence of zinc in the discharge at 0.5 mg/L could be of potential ecological concern, both in the drainage ditch itself and/or in the area of discharge. More information on this ditch is required. The need for sampling of surface soil/sediment/surface water would be dependent on this information. If this drainage ditch is still exposed it is recommended to collect the appropriate number of sediment/soil samples from the drainage ditch for analysis of metals. If not, at the point of discharge and further downstream as necessary.

3.0 SPECIFIC COMMENTS

Specific Comment 1: 1.0 Introduction, §1.1 Site History, next to last ¶, p. 1-2.

This paragraph described the discharge of chiller condensate and non-contact cooling water to a drainage ditch located to the southeast of the Site building. About 4,000 gallons per day for about 150 days per year were released to this ditch between 1984 and 1988. This water was reported to contain zinc at a concentration of 0.5 mg/L, chlorine, and phosphate.

Figure 2 (Site Plan) included in the WP did not show the location of this drainage ditch. The WP also did not indicate where this water flowed. This information needs to be included and fully described in the WP. Depending upon this information, considering the volume of flow, the contaminants, and the duration of the discharge it is likely that sampling and analysis of the appropriate media at the point of discharge may be necessary.

Specific comment 2: 2.0 Problem Formulation, § 2.3 Selection of Specific Ecological Receptors and Exposure Pathways, 2nd ¶, 3rd sentence, p. 2-3.

This sentence reads as follows: "The existing soil data will be evaluated in the SLERA, even though it generally represents deeper soils than ecological receptors are expected to encounter (i.e., 0 to 6")". An issue with this proposed approach is that SLERAs should evaluate direct exposure of terrestrial receptors (soil invertebrates and plants) only to surface soil collected no more than two ft deep.

Table 1 in the Verification Report presented the historical soil data for the Site. Ten soil samples were available, none of which represented true surface samples. Instead, all soils were collected at depths of 0-4 ft (three samples), 4-8 ft (one sample), 6-8 ft (two samples), 7-8 ft (three samples), and 12-16 ft (one sample).

Only real surface soil samples will provide defensible analytical data. The WP needs to be amended to include the necessary surface soil sampling at the Site in support of the SLERA.

Specific comment 3: 2.0 Problem Formulation, § 2.4 Selection of Assessment and Measurement Endpoints, 1st ¶, p. 2-4.

The WP needs to be amended to include an additional assessment and measurement endpoint, as follows:

- Assessment Endpoint 3: The assessment endpoint is the sustainability of the benthic invertebrate community in aquatic habitats in the vicinity of the Site.

- Measurement Endpoint 3-1: Comparison of sediment analytical chemistry results to sediment screening values.

- **Specific comment 4: 2.0 Problem Formulation, § 2.5 Selection of COPCs, 1st ¶, 4th sentence, p. 2-4.**

This sentence reads as follows: "Constituents that were not detected will not be evaluated". This statement needs to be amended by including an additional safety check. The analytical detection limits (DLs) of the non-detected constituents need to be evaluated to ensure that DLs did not exceed the conservative screening benchmarks. A non-detected constituent should automatically be retained as a COPC if its maximum DL exceeds the screening benchmark. A non-detected constituent can be eliminated outright only if it lacks an acceptable screening benchmark.

Specific comment 5: 3.0 Risk Analysis, p. 3-1.

This section needs to be amended by including a third subsection titled "Benthic Receptor Risk Analysis" which will provide, in order of preference, the sources for sediment screening values to be considered in the risk analysis.

4.0 SUMMARY AND CONCLUSIONS

A review was performed on the ecological screening WP prepared for the Arch Site, located in Cheshire, CT. Several issues were identified with the proposed approach which would compromise the ability of the SLERA to validate a determination of the presence or absence of risk to ecological receptors at the Site. The major issues are summarized below:

- Sediment samples and surface water samples need to be collected from the various aquatic habitats (wetlands, detention ponds, outflow reaches) at the Site to assess the potential for ecological risk to aquatic receptors.

- Surface (0-2 ft) soil samples need to be collected from terrestrial areas known or suspected to be areas of contamination to assess the potential for ecological risk to soil invertebrates and plants.

- Sediment, surface water, and soil background samples need to be collected from reference areas to help differentiate Site- from non-Site related contamination.

- Sediment/soil samples should be collected from the drainage ditch or, if no longer present, at the historical point of discharge which received non-permitted releases of chiller condensate and non-contact cooling water between 1984 and 1988.